

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendments, claims 1-8 and 10-11 are pending in the application, with claim 1 being the independent claim. Claim 1 is sought to be amended to more particularly claim the present invention. The amendment makes more explicit that the material is in solid or gel form and is polymerizable. Support for the amendment to claim 1 can be found in the as-filed claim. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Applicants believe that entry of these amendments after final are appropriate because they more clearly differentiate the claims from the cited references.

Based on the above amendments and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 102(b)

Claims 1-6 and 8-11 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,236,493 ("Schmidt").

Applicants respectfully traverse this rejection.

The present invention claims a *polymerizable* composition that contains a soluble polymer, a partially or fully condensed silane, a nanoparticle, and optionally, an acrylate, a softener and an additive.

On the other hand, Schmidt describes a method of forming an optical component by:

- forming a dispersion of nanoparticles in a liquid that is a curable matrix material;
- causing the nanoparticles to migrate to form a distribution gradient; and
- curing the liquid matrix material to provide a solid matrix.

See Schmidt, Abstract, emphasis added.

Therefore, Schmidt describes two different compositions. The first composition described by Schmidt is a liquid precursor matrix that is polymerizable, but that does not contain a polymer. And the second composition described by Schmidt is a solid matrix that contains a polymer (i.e., a matrix that has been polymerized or cured), but which is no longer polymerizable. However, Schmidt fails to disclose a polymerizable composition that contains a polymer.

With respect to a polymerizable composition, the only polymerizable materials disclosed by Schmidt is a curable liquid that serves as a precursor to a solid matrix. Schmidt discloses that suitable species for use in the polymerizable liquid are organic monomers, oligomers, pre-polymers, and inorganic compounds capable of hydrolytic polycondensation. *Id.* at col. 3, ll. 42-45. Nowhere does Schmidt disclose a polymerizable liquid that contains a polymer.

On the other hand, the only material disclosed by Schmidt that contains a polymer is the cured (solid) matrix. *Id.* at col. 3, l. 51. However, the solid matrix described by Schmidt is not polymerizable (i.e., it has already been polymerized). For example, Schmidt describes that nanoparticles are "frozen" within the cured matrix to form a solid structure. *Id.* at col. 1, ll. 17-18 and col. 1, ll. 60-64.

Therefore, because Schmidt does not recite a polymerizable composition containing a polymer, Schmidt does not anticipate claim 1.

In addition, the present claims further require that the gel or solid composition contain a soluble polymer. The Examiner has alleged that "polymers such as PVOH or polyacrylic acid mentioned in Schmidt are solids at room temperature [and] the use of solvents is implied." Office Action dated Feb. 11, 2008, p. 4, ¶ 5. Applicants respectfully disagree. A composition of a soluble polymer dissolved in a solvent, as described by the Examiner, is not described by Schmidt. First, Schmidt does not describe polymers as suitable materials for use in a liquid precursor matrix. Second, nowhere does Schmidt describe a cured matrix that is dissolved, or can be dissolved, in a solvent. On the contrary, Schmidt only describes removing a solvent from a solution to prepare the liquid precursor (i.e., that contains a pre-polymer). Schmidt, col. 5, ll. 25-29. In fact, in each exemplary embodiment of Schmidt a solvent is not present during the curing. *Id.*, Examples 1-5. Thus, nowhere does Schmidt describe or imply, as alleged by the Examiner, dissolving a polymer in a solvent, or that a solid polymer matrix formed would be soluble in a solvent. Moreover, Schmidt describes that the solid polymer matrix is suitable to "freeze in" the nanoparticles present therein, implying a high degree of cross-linking in the solid matrix, and likewise that the final solid matrix of Schmidt has a low solubility.

The Examiner alleged that "an ability of the polymer to dissolve . . . [is not] a limitation which could bar disclosure of Schmidt from being applied against the present claims." Office Action dated Feb. 11, 2008, p. 5, ¶ 2. The Examiner further alleged that "the polymers of Schmidt fully encompass polymers disclosed by the Applicants in their claim 2, therefore since polymers are the same, the effect of using them such gelling or being solid should also be the same." *Id.* at ¶ 3. Applicants respectfully disagree. As

discussed above, the present claims require a soluble polymer, whereas the polymers described by Schmidt are cross-linked by a curing process. Applicants submit that "soluble" is a term recognized by a person of ordinary skill in the art as "susceptible of being dissolved in or as if in a fluid." *Webster's New Collegiate Dictionary*, at 1107 (G. & C. Merriam Co. 1973). Nowhere does Schmidt describe polymers that are soluble in any solvent under any conditions. Therefore, Schmidt cannot anticipate the present claims, which require a soluble polymer.

Applicants seek to clarify their argument regarding the teaching of Schmidt. It is the Examiner's position that "Schmidt clearly indicates that polymers are added to the cured matrix and lists polymers that encompass all species listed in claim 2." *Id.* at p. 5, ¶ 6. On the contrary, Schmidt does not describe a situation in which polymers are added to a cured matrix (as described by the Examiner), but instead Schmidt provides a process whereby a liquid matrix is cured to provide a solid polymer. Applicants' previously submitted arguments were drawn to the notion that Schmidt teaches away from adding a polymer to a liquid matrix prior to the curing step. That is, a person of ordinary skill in the art, upon reviewing Schmidt, would have ample reason to exclude a polymer from the liquid matrix described by Schmidt. This is because Schmidt teaches that the liquid precursor matrix must have a low viscosity in order to permit diffusion of nanoscale particles. *See* Schmidt, col. 2, ll. 27-33 and col. 3, ll. 34-41. A person of ordinary skill in the art would expect that the addition of a polymer to a liquid would increase the viscosity of the liquid, and therefore a person of ordinary skill in the art would have no reason to add a polymer to a liquid matrix that required a low viscosity.

Applicants' above arguments did not concern the addition of a polymer to a cured solid matrix as described by Schmidt. However, if it is the Examiner's position that the cured solid matrix of Schmidt, which is not polymerizable and does not contain a soluble polymer, renders obvious the presently claimed invention, then Applicants submit that a person of ordinary skill in the art would have no reason to prepare the presently claimed invention based on Schmidt. This is because Schmidt describes a solid (cured) matrix that is "suitable for producing all optical components" and that the optical components . . . are preferably solid structures," Schmidt, col. 7, ll. 1-6. However, a soluble polymer and/or a polymerizable species present in the solid (cured) matrix of Schmidt would only decrease the stability of the solid matrix. Therefore, Schmidt provides ample reason for a person of ordinary skill to exclude soluble polymers and/or polymerizable species from the solid matrix described by Schmidt.

The Examiner has also alleged that viscosity is not an element of Applicants' claims. *Id.* at p. 4, ¶ 3 and ¶ 5. Applicants respectfully disagree. The presently claimed invention recites a polymerizable composition in solid or gel form. Applicants submit that a person of ordinary skill in the art at the time of filing would, based on viscosity, readily distinguish between, on the one hand, a gel or solid composition and, on the other hand, a liquid composition. Applicants note that pending claim 1 specifically recites that the composition is a solid or gel in the body of the claim.

Based on the above arguments, Schmidt does not anticipate, nor render obvious, claim 1 of the present invention. Because claims 2-6, 8, 10 and 11 depend from claim 1 and incorporate all of the elements of claim 1, Schmidt does not anticipate or render obvious claims 2-6, 8, 10 and 11 of the present invention. Applicants respectfully

request that the rejection of claims 1-6, 8, 10 and 11 under 35 U.S.C. § 102(b) in view of Schmidt be withdrawn.

Rejections under 35 U.S.C. § 103

Claims 1-8, 10 and 11 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Schmidt in view of either JP 2000-302960 ("Awaji") or U.S. Patent No. 3,787,378 ("Blank").

Applicants respectfully traverse these rejections.

The discussion and arguments presented in Applicants' Amendment and Reply are incorporated herein by reference.

Both Schmidt and the presently claimed invention are concerned with providing materials having a refractive index gradient. In the case of Schmidt the precursor material is a liquid, and thus difficult to handle. However, the presently claimed invention specifies that the precursor is a solid or a gel, which provides improved ease of handling and containment during manufacturing.

Additionally, neither Awaji, Blank, or a combination thereof satisfies the deficiencies of Schmidt in providing a polymerizable composition containing a soluble polymer, as claimed by the present invention. As discussed above, Schmidt describes a polymerizable liquid matrix that contains a polymer precursor, but not a polymer. Similarly, Blank describes a liquid material that contains a polymer precursor but fails to provide any reason to combine a polymerizable composition that contains a polymer. On the other hand, Awaji describes a polymeric resin, but again fails to describe a polymerizable composition that contains a soluble polymer. Because neither Awaji nor

Blank discloses a polymerizable liquid matrix that contains a soluble polymer, the combination of Schmidt with either or any of these references fails to render obvious claim 1 of the present invention.

Claims 2-8, 10 and 11 ultimately depend from claim 1, and claim 1 is non-obvious for the reasons provided above. Therefore, Applicants submit that claims 2-8, 10 and 11 are non-obvious over the cited references and request that the rejections under 35 U.S.C. § 103(a) be withdrawn.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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